

CLAIMS

What is claimed is:

1. A method for making a current collector plate comprising:
 - providing a first sheet of material having a first bonding face and a first outer face;
 - providing a second sheet of material having a second bonding face and a second outer face;
 - creating a plurality of patterned areas on at least one of said first bonding face and said second bonding face;
 - bonding said first and second sheets together; and
 - injecting fluid between said first and second sheets thereby causing at least one of said first and second sheets to project outward at said plurality of patterned areas.
2. The method of claim 1 wherein forming a plurality of patterned areas includes placing an anti-bonding material on at least one of said first bonding face and said second bonding face, and defining bonding areas at the remaining areas of said first bonding face and said second bonding face.
3. The method of claim 2 wherein bonding further includes:
 - contacting said first bonding face with said second bonding face; and
 - imposing a force onto at least one of said first and second outer face thereby joining said first and second sheets at said bonding area.

4. The method of claim 3 wherein contacting said first bonding face with said second bonding face defines a first thickness; and

joining said first and second sheets at said bonding area defines a second thickness, said second thickness less than said first thickness.

5. The method of claim 4 wherein imposing a force includes roll bonding said first and second sheets together.

6. The method of claim 1 wherein injecting fluid further comprises: placing said first and second bonded sheets into a die having spaced apart first and second boundaries; and

injecting fluid between said first and second bonded sheets whereby extension portions contact one of said first and second boundaries so as to form a flat surface thereat.

7. The method of claim 1 wherein injecting fluid between said first and second sheet includes forming a flow channel between said first and second sheet.

8. The method of claim 1, further comprising applying a conductive coating onto said first and second outer face.

9. A method for making a current collector plate comprising:

placing an anti-bonding material onto a first surface of a first sheet of material in a predetermined pattern thereby forming patterned areas defined by said anti-bonding material and adjacent non-patterned areas;

contacting a second sheet of material with said anti-bonding material;

forming a metallurgical bond between said first and second sheets at said non-patterned areas thereby creating a two-piece bonded plate; and

introducing fluid between said two-piece bonded plate to cause at least one of said first and second sheets to project outward defining projected portions at said patterned area.

10. The method of claim 9 wherein introducing fluid further comprises:

placing said two-piece bonded plate into a die having a first boundary and a second boundary; and

injecting fluid between said two-piece bonded plate whereby said projected portions contact one of said first boundary and said second boundary so as to form a flat surface thereat.

11. The method of claim 10 wherein injecting fluid between said two-piece bonded plate includes forming a flow channel between said first and second sheet.

12. The method of claim 11 wherein said flow channel corresponds to a coolant flow channel.

13. The method of claim 9 wherein forming a metallurgical bond includes roll bonding said first and second sheet together.

14. The method of claim 9, further comprising rolling said first and second sheet from a rolled stock of material.

15. The method of claim 9, further comprising applying a conductive coating onto an outer face of said respective first and second sheet.

16. A method for making a current collector plate comprising:
 - providing a first sheet of conductive material;
 - providing a second sheet of conductive material;
 - placing an anti-bonding material in a desired pattern over a bonding surface of said first sheet of conductive material, said pattern of anti-bonding material defining an anti-bonding area along said first sheet, wherein the remaining surface of said bonding surface absent said anti-bonding material defines a bonding area;
 - contacting said second sheet of conductive material with said anti-bonding material of said first sheet of conductive material;
 - roll bonding said first and second sheets together whereby said first and second sheets form a metallurgical bond therebetween at said bonding area;
 - and
 - injecting fluid between said first and second bonded sheets whereby said anti-bonding area is expanded outwardly defining expanded portions along said desired pattern.

17. The method of claim 16 wherein injecting fluid further comprises:
 - placing said first and second bonded sheets into a die having a first and second boundary; and
 - injecting fluid between said first and second bonded sheets whereby said expanded portions contact one of said first and second boundary so as to form a flat surface thereat.